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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,727	05/23/2000	Chad A. Cobbley	3639.1US (97-1383.1)	3108
7590	06/17/2004		EXAMINER	
James R. Duzan Trask Britt P O Box 2550 Salt Lake City, UT 84110			TRINH, MINH N	
			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/576,727	Applicant(s) COBBLEY ET AL.	
	Examiner Minh Trinh	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-20 and 22-34 is/are pending in the application.
 4a) Of the above claim(s) 9-17 and 26-34 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-3, 5-8, 18-20, and 22-25 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Prosecution Application

1. Receipt is acknowledged of the "conditional" request for RCE application is acceptable and a RCE has been established. An action on the RCE follows.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-3, 5-8, 18-20 and 22-25 are being rejected under 35 U.S.C. 101 because the claimed invention due to the fact that the scope of the claims is directed to both statutory classification i.e., "an assembly" and "an apparatus" for assembly a substrate (refer amended claims 1-3, 5-8, 18-20 and 22-25, preamble). It appears that the claims are directed to an apparatus for placing solder ball on at least a surface of a substrate to form a PCB assembly but not "an assembly comprising an apparatus and a substrate, as recited in the preamble of rejected claims listed above".

5. Claim 1-3, 5-8, 18-20 and 22-25 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the scope of the claimed invention is un identified and is

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not seem to have support for the reasons set forth above, one skilled in the art clearly would not know how to use or make the claimed invention.

6. Claims 1-3, 5-8, 18-20 and 22-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following are examples:

a) The preamble of claims 1-3, 5-8, 18-20 and 22-25 (as amended) is unclear and confusing. It is uncertain whether it directs to an assembly, and apparatus and or a substrate i.e., by reading the body of the rejected claims it appears that they are directed to an apparatus for forming a substrate assembly, therefore it is suggested the preamble of rejected claims above, lines 1-3 should have been amended to read on: -- An apparatus for forming a substrate assembly--, or "-- an assembly system comprising--", etc., or the like in order to clarify the claimed invention.

b) The scope of claims 1-3, 5-8, 18-20 and 22-25 is not clear because it is directed to an assembly and an apparatus for carrying out the claimed function of "placing a plurality of conductive spheres on a substrate" (claim 1, lines 2-3).

c) It is also not clear whether "a substrate" (claim 1, line 15; claim 18, line 17) is the same as "a substrate" as recited in claim 1, line 2 and claim 18, line 2 respectively. It is also noted that the substrate recited in these claims is not a part of the apparatus, it is just an operatively associated substrate. Therefore, "a substrate" here should have been changed to: -- the substrate--, so as to clarify the claimed subject matter.

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7. Claims 1-3, 6-8, 18-20 and 23-25, as best understood are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al (US 5,655,704) in view of Yeh et al (US 5,607,099).

Sakemi et al disclose an apparatus for placing a plurality of conductive spheres on a substrate comprising: a stencil plate 4 with upper and lower surfaces and a first pattern of plurality of through holes 4a, said stencil plate configured to place a plurality of conductive spheres 3 in said first pattern on a approximate surface of the substrate 2(see Figs. 3-4); a hopper (container 12) extending across at least a portion of the upper surface of said stencil plate 4 and closely spaced (gap between 12 and surface of 4) therefrom to maintain control over all the spheres therein (see Fig. 4, col. 4, lines 28-36) the hopper 12 having a bottom opening with a dimension extending across the first pattern for dispersing said spheres into the through holes 4a of the stencil plate 4 and a position apparatus 8 (see Fig. 1) for moving the hopper 12 over the first pattern relative to the stencil plate 4 (see Fig. 4) for place said spheres into said through holes 4a onto the proximate surface of said substrate 2 (see Fig. 4). Sakemi et al do not teach the substrate having an upper surface and bearing conductive sites comprising one of recesses sites and level sites with respect to said upper surface thereof. Yeh et al teach the substrate¹⁰ having an upper surface (top surface) and bearing conductive sites comprising one of recesses sites 12 including level sites with respect to said upper surface (see illustration of Figs. 2-3, at col. 4, lines 30-49, and at col. 5, lines 4-10). Therefore, It would have been obvious to one ordinary having skill in the art at the time the invention was made to employ the teaching of the substrate having an upper

surface and bearing conductive sites comprising recesses sites and level sites with respect to its upper surface as taught by Yeh et al into the invention of Sakemi et al for receiving and controlling of the corresponding conductive sphere in an effective and efficient manner.

As applied to claims 2-3 and 6, Sakemi et al teach the spheres being dropped and passed downwardly through the through holes by gravitation force as recited in claim 2 (see Fig. 4 which shows the solder balls being gravity fed into the mounting pads of the substrate 2); and the limitations of claims 3 and 6 (refer to Fig. 4 and the discussion at col. col. 4, lines 28-36).

As applied to each of claim 7-8, Sakemi et al teach the stencil 4 is being placed apart from the substrate 2 (see illustration of Fig. 4).

As applied to claims 19-20 and 23, Sakemi et al teach the spheres being dropped and passed downwardly through the through holes by gravitation force as recited in claim 19 (see Fig. 4 which shows the solder balls being gravity feed into the mounting pads of the substrate 2); and the limitations of claims 20 and 23 (see Fig. 4, and the discussion at col. col. 4, lines 28-36).

As applied to claims 24 and 25, Sakemi et al teach the stencil 4 being placed apart from the substrate 2 (see illustration of Fig. 4).

8. Claims 5 and 22 as best understood are rejected under 35 U.S.C. 103(a) as obvious over Sakemi et al in view of Yeh et al.

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As applied to claims 5 and 22, Sakemi et al or Yeh et al as applied and relied upon above do not teach the first pattern holes diameter is greater than the diameter of each of the spheres by up to 1mm. With respect to the above configurations, it would have been an obvious matter of design choice to choose pattern holes diameter greater than the diameter of the spheres since applicant has not disclosed that "the first pattern holes diameter is greater than the diameter of each of the spheres by up to 1mm" would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the with the commonly used configurations as suggested by the applied references (see Fig. 4 of Sakemi et al, which shows the pattern holes 4a being greater that the diameter of the spheres 3).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (703) 305-2887. The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7307 for regular communications and (703) 305-3579 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.



Minh Trinh
Patent Examiner Group 3729

mt
June 15, 2004